

MONTHLY NOTICES  
OF THE  
ROYAL ASTRONOMICAL SOCIETY.

VOL. XXXI.      February 10, 1871.      No. 4.

WILLIAM LASSELL, Esq., President, in the Chair.

T. G. E. Elger, Esq., Bedford; and  
H. C. Russell, Esq., Superintendent of the Sydney Observa-  
tory,

were balloted for and duly elected Fellows of the Society.

*Report of the Council to the Fifty-first General Meeting of  
the Society.*

Progress and present state of the Society:—

	Compounders.	Annual Contributors.	Non-residents.	Patroness, and Honorary.	Total Fellows.	Associates.	Grand Total.
December 31, 1869	187	311	11	3	12	45	557
Since elected ...	+ 7	+ 18	...	...	...	...	...
Deceased ... ..	— 4	— 6	— 1	..	...	— 1	...
Removals ... ..	+ 2	— 2	...	...	...	...	...
Resigned ... ..	...	— 8	...	...	...	...	...
Names removed for non-payment of arrears, &c. ...	...	— 8	...	...	...	...	...
Dec. 31, 1870 ...	192	305	10	3	510	44	554

# Report of the Council

## Mr. Whitbread's Account as Treasurer of the R

### RECEIPTS.

	£	s.	d.	£	s.
Balance of last year's account ... ..				102	17
By Dividend on £3400 Consols ... ..	49	18	9		
By ditto on £5000 New 3 per Cents ... ..	73	8	9		
By ditto on £3400 Consols ... ..	50	3	0		
By ditto on £5000 New 3 per Cents ... ..	73	15	0		
				247	5
On account of arrears of contributions ... ..	179	11	0		
186 annual contributions ... ..	390	12	0		
24 admission-fees ... ..	50	8	0		
17 first years' contributions ... ..	28	7	0		
				648	18
9 compositions ... ..				189	0
Sale of publications:—					
At the Rooms of the Society ... ..	41	3	0		
By Messrs. Williams and Norgate, Publishers	37	17	4		
				79	0

£1267 1

*Astronomical Society, from January 1 to December 31, 1870.*

## EXPENDITURE.

Salaries :—				£	s.	d.	£	s.	d.
Editor of Publications	...	...	...	60	0	0			
Assistant Secretary	...	...	...	130	0	0			
Commission on Collecting 69ol. 1s.				34	10	0			
							224	10	0
Taxes :—				£	s.	d.			
Land and Assessed	...	...	...	6	11	0			
Income	...	...	...	2	1	8			
Poor Rate	...	...	...	5	12	6			
Other Parish Rates	...	...	...	5	12	6			
							19	17	8
Bills :—				£	s.	d.			
Strangeways and Walden, printers	...			510	4	10			
Rumfitt, bookbinder	...	...	...	22	6	8			
Malby and Co., engravers	...	...	...	11	18	0			
W. Metcalf ditto	...	...	...	29	14	9			
Troughton and Simms	...	...	...	7	0	0			
Insurance	...	...	...	7	15	6			
Dr. Brünnow	...	...	...	30	0	0			
							618	19	9
Miscellaneous items :—				£	s.	d.			
House expenses	...	...	...	23	17	10			
Postages	...	...	...	40	14	8			
Books and parcels	...	...	...	4	17	1			
Expenses of evening meetings	...	...	...	13	13	0			
Waiters attending meetings	...	...	...	3	17	0			
Coals and wood	...	...	...	12	0	0			
Gas	...	...	...	6	9	8			
Repairs	...	...	...	2	12	6			
Sundries	...	...	...	9	10	9			
							117	12	6
							980	19	11
Lee Fund	...	...	...	5	0	0			
Turnor Fund	...	...	...	1	19	3			
Mrs. Jackson Gwilt's annuity, 1 year	...			8	16	0			
							15	15	3
							996	15	2
Banker, New Cheque Book	...	...	...		0	5	0		
							997	0	2
Balance at Banker's	...	...	...		270	1	2		
							£1267	1	4

Examined and found correct, Jan. 27, 1871,

(Signed) H. PERIGAL,  
F. C. PENROSE,  
W. B. GIBBS, } Auditors.

Assets and Present Property of the Society, January 1, 1871:—

	£	s.	d.	£	s.	d.
Balance at Banker's ... ..	...	...	...	270	1	2
1 Contribution of 9 years' standing ...	18	18	0			
3       "       7       "       ... ..	44	2	0			
7       "       6       "       ... ..	88	4	0			
5       "       5       "       ... ..	52	10	0			
14       "       4       "       ... ..	117	12	0			
13       "       3       "       ... ..	81	18	0			
19       "       2       "       ... ..	79	16	0			
29       "       1       "       ... ..	60	18	0			
Balance of an Account... ..	4	14	0			
				548	12	0
Due for Publications ... ..				2	7	0
£5000 New 3 Per Cents (including Mrs. Jackson's Gift, £300).						
£3400 Consols, including the Lee Fund (£100) and Turnor Fund (£500).						
Unsold Publications of the Society.						
Various astronomical instruments, books, prints, &c.						
Balance of Turnor Fund (included in Treasurer's Account)				152	12	9

Stock of volumes of the *Memoirs*:—

Vol.	Total.	Vol.	Total.	Vol.	Total.
I. Part 1	12	XIII.	199	XXVII.	456
I. Part 2	52	XIV.	392	XXVIII.	416
II. Part 1	70	XV.	174	XXIX.	448
II. Part 2	34	XVI.	200	XXX.	297
III. Part 1	86	XVII.	183	XXXI.	173
III. Part 2	105	XVIII.	177	XXXII.	204
IV. Part 1	103	XIX.	184	XXXIII.	208
IV. Part 2	114	XX.	180	XXXIV.	196
V.	126	XXI. Part 1	216	XXXV.	169
VI.	152	XXI. Part 2	100	XXXVI.	255
VII.	176	XXI. (together).	91	(with M. N.)	
VIII.	162	XXII.	182	XXXVI. (without)	47
IX.	165	XXIII.	177	XXXVII.	518
X.	175	XXIV.	183	Part 1	
XI.	185	XXV.	196	XXXVII. Part 2	476
XII.	190	XXVI.	201	XXXVIII.	494

The instruments belonging to the Society are as follows:—

The *Harrison* clock,  
 The *Owen* portable circle,  
 The *Beaufoy* circle,  
 The *Beaufoy* transit,  
 The *Herschelian* 7-foot telescope,  
 The *Greig* universal instrument,  
 The *Smeaton* equatoreal,  
 The *Cavendish* apparatus,  
 The 7-foot Gregorian telescope (late Mr. Shearman's),  
 The Variation transit (late Mr. Shearman's),  
 The Universal quadrant by Abraham Sharp,  
 The *Fuller* theodolite,  
 The Standard scale,  
 The *Beaufoy* clock, No. 1,  
 The *Beaufoy* clock, No. 2,  
 The *Wollaston* telescope,  
 The *Lee* circle,  
 The *Sharpe* reflecting circle,  
 The *Brisbane* circle,  
 The *Baker* universal equatoreal.  
 The *Reade* transit.

The *Sheepshanks'* collection of instruments, viz.,—

1. 30-inch transit, by Simms, with level and two iron stands.
2. 6-inch transit theodolite, with circles divided on silver; reading microscopes, both for altitude and azimuth; cross and siding levels; magnetic needle; plumbline; portable clamping foot and tripod stand.
3.  $4\frac{6}{10}$ -inch achromatic telescope, about 5 feet 6 inches focal length; finder, rack motion; double-image micrometer; object-glass micrometer; two other micrometers; one terrestrial and ten astronomical eyepieces, applied by means of two adapters, with equatorial stand and clock movement.
4.  $3\frac{1}{4}$ -inch achromatic telescope, with equatorial stand; double-image micrometer; one terrestrial and three astronomical eyepieces.
5.  $2\frac{3}{4}$ -inch achromatic telescope, with stand; one terrestrial and three astronomical eyepieces.
6.  $2\frac{3}{4}$ -inch achromatic telescope, about 30 inches focus; one terrestrial and four astronomical eyepieces.
7. 2-foot navy telescope.
8. 45-inch transit instrument, with iron stand, and also Y's for fixing to stone piers; two axis levels.
9. Repeating theodolite, by Ertel, with folding tripod stand.
10. 8-inch pillar sextant, divided on platinum, with counterpoise stand and horizon roof.
11. Portable zenith instrument, with detached micrometer and eyepiece.

12. 18-inch Borda's repeating circle, by Troughton.
13. 8-inch vertical repeating circle, with diagonal telescope, by Troughton and Simms.
14. A set of surveying instruments, consisting of a 12-inch theodolite for horizontal angles only, with extra pair of parallel plates; tripod staff; in which the telescope tube is packed; repeating table; level collimator, with micrometer eyepiece; and Troughton's levelling staff.
15. Level collimator, plain diaphragm.
16. 10-inch reflecting circle, by Troughton, with counterpoise stand; artificial horizon, with metallic roof; two tripod stands, one with table for artificial horizon.
17. Hassler's reflecting circle, by Troughton, with counterpoise stand.
18. 6-inch reflecting circle, by Troughton, with two counterpoise stands, one with artificial horizon.
19. 5-inch reflecting circle, by Lenoir.
20. Reflecting circle, by Jecker, of Paris.
21. Box sextant and 3-inch plane artificial horizon.
22. Prismatic compass.
23. Mountain barometer.
24. Prismatic compass.
25. 5-inch compass.
26. Dipping needle.
27. Intensity needle.
28. Ditto ditto.
29. Box of magnetic apparatus.
30. Hassler's reflecting circle, with artificial horizon roof.
31. Box sextant and  $2\frac{1}{4}$ -inch glass plane artificial horizon.
32. Plane speculum artificial horizon and stand.
33.  $2\frac{1}{2}$ -inch circular level horizon, by Dollond.
34. Artificial horizon roof and trough.
35. Set of drawing instruments, consisting of 6-inch circular protractor; common ditto; 2-foot plotting scale; two beam compasses and small T square.
36. A pentagraph.
37. A noddy.
38. A small Galilean telescope, with the object lens of rock-crystal.
39. Six levels, various.
40. 18-inch celestial globe.
41. Varley stand for telescope.
42. Thermometer.
43. Telescope, with the object-glass of rock crystal.

These are now in the apartments of the Society, with the exception of the following, which are lent, during the pleasure of the Council, to the several parties under mentioned, viz.:—

The *Fuller* theodolite, to the Director of the Sydney Observatory.

The *Beaufoy* transit, to the Observatory, Kingston, Canada.

The *Sheepshanks* instrument, No. 1, to Mr. Lassell.

Ditto ditto No. 2, to Mr. Huggins.

Ditto ditto No. 3, to Mr. Brothers for the Eclipse Expedition.

Ditto ditto No. 4, to Rev. C. Lowndes.

Ditto ditto No. 5, to Mr. Birt.

Ditto ditto No. 6, to Rev. J. Cape.

Ditto ditto No. 8, to Rev. C. Pritchard.

Ditto ditto No. 9, to the Director of the Sydney Observatory.

Ditto ditto No. 41, to Rev. C. Pritchard.

Ditto ditto No. 43, to Mr. Huggins.

The 6-inch circular protractor, to Mr. Birt.

## PRINTED TRANSACTIONS OF THE SOCIETY.

### *Memoirs.*

Part II. of Volume XXXVII., and Volume XXXVIII. of the *Memoirs* have been published since the last Annual Report. They contain the following papers, all of which are printed *in extenso*.

Volume XXXVII., Part II.:—

1. "On a Determination of the Direction of the Meridian with a Russian Diagonal Transit Instrument." By Capt. A. R. Clarke, R.E., F.R.S.

The instrument with which these observations were made was constructed for the Royal Observatory, Greenwich, by M. Brauer, of the Imperial Observatory, at Pulkowa, in such a manner that the rays of light, after passing through the object-glass, are bent at right-angles by a prism placed in the central tube, and then pass out at one of the pivots. The great advantage derived from an instrument of this construction is that the transit of an object at any altitude can be made without altering the position of the observer's head. This Russian transit was used, under the direction of Capt. Clarke, at Findlay Seat, a mountain in Elginshire, from October 13 to 31, 1868, for the special purpose of determining the true direction of the Meridian. The detailed results of the observations are given in the paper, and they give strong evidence in favour of the stability and excellence of the instrument.

2. "A Determination of the Constant of Nutation from the Observations in N.P.D. of *Polaris*, *Cephei* 51, and  $\delta$  *Ursæ Minoris*, made with the Transit-circle of the Royal Observatory, Greenwich, 1851-65." With an Addendum containing "A De-

termination of the Constant of Nutation from the Observations of *Polaris* in Right Ascension." By E. J. Stone, Esq., M.A., F.R.S.

In this investigation Mr. Stone has availed himself of the results of all the observations of the above Polar stars in N.P.D. and of the deduced Right Ascensions of *Polaris* only, which appear in the "Ledgers" of the *Greenwich Observations* from 1851 to 1865. Special care has been taken to make the corrections for division-errors, astronomical flexure, and zenith points in the different years under one uniform system. The mean value of the constant as determined by Mr. Stone from the four series of observations is  $9''.134$ , or  $0''.090$  less than Professor Peters' value published in *Numerus Constans Nutationis*. Tables containing the details of the computations are appended to the Paper.

Volume XXXVIII:—

1. "Seventh Catalogue of Double Stars, observed at Slough, in the years 1823–28 inclusive, with the 20-feet Reflector; 84 of which have not been previously described." By Sir J. F. W. Herschel, Bart., F.R.S.

This Catalogue contains a number of double stars which were observed by Sir John Herschel in the course of his earlier stellar sweeps at Slough, and which, for various reasons, were omitted in preceding catalogues. Many of the estimated angles of position, Sir John Herschel considers, possess a considerable historical value, inasmuch as in many instances they were made at a date anterior to any recorded measurements, while others are the only existing records of position. This Catalogue, therefore, forms a valuable addendum to the previous Double-Star Catalogues of that accomplished observer.

2. "On the Determination of the Orbit of a Planet from Three Observations." By Professor Cayley, F.R.S.

This valuable mathematical paper is drawn up by Professor Cayley in considerable detail, and occupies the principal portion of the volume. The first sections are devoted to considerations on the general theory of the problem, followed by formulæ and deductions, illustrated by five lithographic plates.

### *Monthly Notices.*

In addition to the preceding Papers, several others of equal interest are printed in full, or in abstract, in the *Monthly Notices*. Some of these are made the subject of special remark in another section of the Report.

### *General Index to the Monthly Notices.*

In consequence of a frequently-expressed want of a means of more easy reference to the Papers and reports in the volumes of the *Monthly Notices*, the Council requested the Assistant-Secretary, Mr. Williams, to prepare a General Index of Volumes

I.—XXIX., which included the whole series at the time of going to press. The work of compilation was a laborious one, for it consisted not only of arranging the annual indexes into one index, but also of making a considerable number of additional entries both of names and subjects. The Index was placed in the hands of the Fellows in November last, and its value has been acknowledged by those who have had occasion to refer to it.

#### OBITUARY.

The Society has to regret the loss by death of the following Fellows and Associate:—

Fellows:—Prof. E. W. Brayley.  
 Mr. C. Mason.  
 Admiral Manners.  
 Mr. H. Boys.  
 Sir F. Pollock.  
 Rev. Dr. Gwatkin.  
 Mr. G. R. Smalley.  
 Mr. J. G. Perry.  
 Mr. C. D. Archibald.  
 Mr. C. Frodsham.  
 Lieut.-Gen. Sir W. T. Denison, K.C.B.  
 Mr. H. Barrow.

Associate:—Prof. H. Selander.

RUSSELL HENRY MANNERS was born in London on the 31st of January, 1800. He was the only child of the late Mr. Russell Manners, M.P. Having in early life evinced a desire for the naval profession, he was placed at the Royal Naval College on the 6th of May, 1813, where he remained until he completed the course of instruction which was to qualify him for his future career. On the 6th of March, 1816, he embarked as a volunteer on board the *Minden*, 74, Captain Paterson, in which, after assisting at the bombardment of Algiers, he proceeded to the East Indies. During his residence in India he served under the flag of Sir Richard King. On the 1st of July, 1818, he was nominated midshipman to the *Orlando*, 36, commanded by Captain John Clavell, with whom, in 1819, he returned to England in the *Malabar*, 74. After an intermediate employment on the Channel and West India stations in the *Spartan* and *Pyramus* frigates, under Captains William Furlong Wise and Francis Newcombe, he became, on the 29th of July, 1822, acting Lieutenant of the *Tyne*, 26, Captain John Edward Walcot, to which ship the Admiralty confirmed him on the 19th October following. In May, 1823, he rejoined the *Pyramus*, still commanded by Captain Newcombe, under whom he continued until he obtained his promotion on the 16th of August, 1825. His last appointment was on the 21st of October, 1827, when the command